REMARKS / ARGUMENTS

Examiner Pompey is thanked for the thorough examination of the subject Patent Application. The Claims have been carefully reviewed and amended, and are considered to be in condition for allowance.

Reconsideration of the rejection under 35 USC §103(a) of Claims 23-33 as being unpatentable over U.S. Patent 5,811,347 (Gardner et al.) in light of the following argument. Gardner et al. does not demonstrate:

> a nitrogen doped insulating liner grown on sidewalls of the shallow trenches by treating said sidewalls with an oxygen rich atmosphere followed with treating said sidewalls with a nitrogen compound; (Claim 23, Lines 4-6)

The nitrogen doped insulating liner grown on sidewalls of the shallow trenches by treating the sidewalls with an oxygen rich atmosphere followed by treating the sidewalls with a nitrogen compound provides more oxygen atoms within the insulating liner than that provided by Gardner et al.

While Gardner et al. does in fact provide, in a macro view, a nitrogen doped liner grown on the sidewalls of a shallow trench, in the micro view, the nitrogen doped liner grown on the sidewalls of the shallow trench is fundamentally different. The liner of Gardner et al. is grown by first growing the nitride and then exposing the liner to an atmosphere of oxygen to form the oxynitride. The liner has a

gradient of nitrogen that decreases from the floor and sidewalls of the trench to the exposed atmosphere.

The liner of this invention could not have the gradient of Gardner et al. with the nitrogen compounds being deposited first to grow the silicon nitride and then the oxygen compounds to grow the oxynitrides. There is no teaching in Gardner et al. to this type of construction of the insulating liner. Further, the time for growth of the liner as taught in Gardner is from 30 second to 120 seconds for the nitride growth and 1 minute to 3 minutes for the oxygen atmosphere for the growth of the silicon oxynitride. Whereas, the liner of this invention is exposed to the oxygen compounds for 60 to 120 minutes and the nitrogen compounds for 30 minutes to 90 minutes. As is known in the art, the amount of time exposed would prevent the gradient as taught in Gardner et al.

Claim 23 is further amended to eliminate the annealing of the gap filling insulating material filling the shallow trenches to appropriately broaden the claim. The key element of Claim 23 is the nitrogen doped insulating liner grown on sidewalls of the shallow trenches by treating said sidewalls with an oxygen rich atmosphere followed with treating said sidewalls with a nitrogen compound. Claim 34 is added to provide the limitation of the gap filling insulating material being high temperature annealed to cause said gap filling insulating material to become more dense.

Applicant understands that Examiner's **FINAL** position re this application and believes that the claims are in condition for allowance.

Applicant respectfully requests that a timely Notice of Allowance for all claims be issued in this case.

It is requested that should the Examiner Pompey not find that the Claims are now allowable, that the undersigned be called at (845) 452-5863 to overcome any problems preventing allowance.

Respectfully Submitted,
/4.3U Attorney Docket: TS97-510B

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